

REMARKS

Claims 1-69 are pending. In a previous office action, the Examiner indicated that claims 6-16, 24-36, and 54-62 were objected to as being dependent upon a rejected base claim, but would be allowable if amended to incorporate base and intervening limitations. However, the Examiner is now rejecting the objected to claims. Claims 1-69 including independent claims 1, 22, 44, 63, and 67 are rejected under 35 U.S.C. 102(e) as being anticipated by Fawaz (USP 6,970,424).

Fawaz describes “Service Level Agreements, or SLA's, are defined between pairs of Packet Switches and guarantee a minimum quality-of-service (minimum bandwidth) between the two packet switches. When a packet arrives at a node from a packet switch, the node inspects certain classification information contained within the packet. In one embodiment, such classification information is the source and destination identifiers (e.g., addresses) of the packet, while in other embodiments classification information additionally includes other information. Using the classification information, the packet classifies the packet with an SLA. A scheduler in the node ensures that packets from each SLA are scheduled for transmission at at least the minimum data rate corresponding to the SLA.” (column 4, lines 23-37)

The material the Examiner cites Fawaz does not describe “sending a first instruction from the network switch to the first intermediate switch for the first intermediate switch to control traffic from the source node to the destination node, wherein the first instruction is based on the operation of characterizing of traffic flow at the network switch” or “receiving a second frame that was generated by the second intermediate node, the second frame having a source identifier corresponding to the second end node and a destination identifier corresponding to the first end node, wherein the second frame is received at the first intermediate node and includes instructions for the first intermediate node to adjust the current allowed rate from the first end node to the second end node” as is recited in independent claims.

Fawaz only describes a particular node characterizing traffic and the same node using a “scheduler in the node” to ensure that service level agreements are met (SLA). There is no sending a first instruction to the first intermediate switch for the first intermediate switch to control traffic. Fawaz controls traffic at a scheduler at the same node where the traffic

characterization takes places. Similarly, Fawaz describes not receiving a frame that includes instructions to adjust the current allowed rate from another node.

Furthermore, Fawaz does not teach or suggest any fibre channel switch as recited in the claims. The Examiner argues that Fawaz recites “Further, the actual links between the QoS Nodes can be formed in any manner known to those of skill in the art. For instance, the links interconnecting the QoS Nodes can be built from single or multiple twisted wire pairs, optical fibers, or coaxial cable. In other embodiments, the links can be radio links, or even free space infrared links. In addition the protocol used by the links may be based on Gigabit Ethernet, ATM, WDM, SONET, or other technology.” However, Fawaz never specifically describes any fibre channel switch and only makes passing reference to other technologies.

Fibre channel switches operate in a different manner than conventional Ethernet switches. Technologies can not be readily cross applied between the different switch types. For example, fibre channel switches do not allow for out of order delivery or ready packet dropping as is allowed by Ethernet switches and routers. As noted in the specification, “Many conventional network protocols use packet dropping to alleviate congestion at a network node. In one example, a network node in an IP based network receives input data from multiple sources at a rate exceeding its output bandwidth. In conventional implementations, selected packets are dropped to allow transmission of remaining packets within the allocated output bandwidth. Packets can be dropped randomly or by using various selection criteria. The dropped packets are ultimately retransmitted under the control of a higher level protocol such as TCP.

In networks such as fibre channel networks, packet dropping is generally not allowed. Instead, networks such as fibre channel networks implement end-to-end and buffer-to-buffer flow control mechanisms. End-to-end and buffer-to-buffer flow control mechanisms do not allow a first network node to transmit to a second network node until a second network node is ready to receive a frame. The second network node typically indicates that it is ready to receive a frame by granting credits to the first network node. When frames are transmitted, credits are used. When no credits remain, the first network node can no longer transmit to the second network node. However, end-to-end and buffer-to-buffer flow control mechanisms provide only a very rough technique for controlling congestion, as the mechanism blocks all traffic along a particular link. Such blocking can quickly propagate upstream to other links in a fibre channel network topology. Some of these links might serve as corridors for paths that do not include the

originally congested link. Hence, congestion at one link of one network path can sometimes cause blocking over a much wider portion of a fibre channel topology.” (page 1, line 24 – page 2, line 4)

Fawaz in fact alludes to difficulties in applying the technology to other types of networks. “Yet, the frame structure for Ethernet (or other) packets does not need to be modified as they would for SONET and ATM, causing the system to appear to the packet switch as a shared Ethernet. Nor does a system in accordance with the invention require complex hardware and software akin to that required for ATM.” (column 10, lines 56-62) Fawaz does not even begin to address or even recognize difficulties of applying the Fawaz technology to fibre channel switches.

In light of the above remarks relating to independent claims the remaining dependent claims are believed allowable for at least the reasons noted above. Applicants believe that all pending claims are allowable. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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